

Notes on wild food
and on geology of the
Lincoln-Helena area.

This stuff was probably
together in a large
envelope in box under
shelves in SE corner of
cabin.

Information on the
geology of the Helena
region

Algonkian - Most recent at top;
(pre-Cambrian)
Marsh shale: Red and yellowish-green shale
and thin-bedded sandstone
Helena Limestone: Impure blue to gray
noncrystalline limestone - weathers to buff,
velvety-looking surface.
Empire shale: Shale and greenish-gray slate
with characteristic purple spots
Spokane shale: thin-bedded siliceous
shales, usually deep-red

Quartz monzonite (Boulder batholith)
composed essentially of plagioclase, orthoclase,
quartz, biotite, and hornblende

Andesite Lava flows - area of Crater Mtn.
Post-Boulder Batholith? Purple and gray - pre-volcanic

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variety is a fine-grained lead-gray rock with a platy habit that causes it to resemble slate. Probably of Oligocene age.

Boulder Batholith early Eocene.

entirely black - not brown

very fine-grained - crystalline and
entirely black - not brown
entirely black - not brown

very fine-grained - crystalline and
entirely black - not brown
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~~1/2 list of new~~
List of new wild foods eaten (cont-
inuation of earlier list)

Rabbit

Porcupine

Coyote

Bitterroot (*Lewisia rediviva*)

sweet cicely leaves (*Osmorrhiza* sp.)

Cowas roots (*Lomatium utriculatum*)

Wild duck (Gadwall, *Anas strepera*; ^{mallard} ~~and~~ ^{spatula} ~~dypeata~~)

Erythronium grandiflorum (western variety of dog-tooth
violet)

Dodecatheon sp. (shooting-star) leaves

Camas bulbs (*camassia* sp.)

Leaves of Yellow Monkey Flower (*Mimulus guttatus*)

Marmot (yellow-bellied)

Sagebrush (*Artemisia tridentata*) leaves for
seasoning and as tea

F Twinberries (*Lonicera utahensis*)

F *Lonicera involucrata* berries.

F Oregon grapes (*Barberis repens*)

Muskrat

Deer meat (mule deer)

Steller's Jay

Yampa (*Perideridia gairdneri*)

Native watercress (*Cardamine pensylvanica*)

Douglas fir - needle tea (*Pseudotsuga menziesii*)

Elk (*Cervus canadensis*)

Weasel (*Mustela* sp., probably *vison*)

Bistort (*Polygonum* sp.)

Angelica (probably *A. lucida*, ~~or~~ *argentea*)

Woodrat (*Neotoma cinerea*)

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Notes on Montana Wilderness

Golden Currant (*Ribes aureum*)
Mountain ash berries (*Sorbus* sp.) (as jelly only)
Ceanothus velutinus (as tea only)
"Unknown Mustard" } unidentified members of Mustard family.
"Lanceleaf Mustard" }
Ground squirrel (*Citellus columbianus* or *richardsoni*)
Indian paintbrush flowering heads (*Castilleja miniata*)
Brooklime (*Veronica* sp.)
Dogwood berries (*Cornus sericea*)
Yarrow (*Achillea millefolium lanulosa*) (As tea only also
in very small amounts
as ingredient of salads
and pot herbs)
Waterleaf (*Hydrophyllum* ~~cap~~ *capitatum*)
Salsify flowers
Flying squirrel (*Glaucomys sabrinus*)
Brook Saxifrage (*Saxifraga punctata*)
White-footed mouse (*Peromyscus* sp.)
Canada Jay (*Perisoreus canadensis*)
Alder buds (*Alnus* sp.)
Shepherd's-purse greens (*Capsella bursa-pastoris*)
Penny-cress seeds (*Thlaspi arvense*) (ground up for use in bread)
Yellow Fritillary roots (corms) (*Fritillaria pudica*)
Leopard Frog's legs (*Rana sphenoccephala*)
Aster (White Aster - *Aster ledophyllus* or *Engelmannii*)
Grasshoppers (boiled)
Balsamroot leaves (*Balsamorhiza sagittata*)
Liverberries (twisted-stalk berries - *Streptopus amplexifolius*)
Buds and young leaves of Black currant (smooth-berried) *Ribes* sp.
Povertyweed (*Monolepis nuttalliana*)

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Potherbs and salads

Rose petals (*Rosa* sp.)

Violet leaves (*Viola* sp.)

Dog-tooth violet (*Erythronium* - an eastern species, probably *americanum*)

Erythronium grandiflorum (western relative of dog-tooth violet)

Mint (*Mentha arvensis* - as tea only; *Agastache urticifolia* - as tea and (in small quantities) as potherb and salad; *Marrubium vulgare* - as tea, and, sparingly, as salad.)

Sassafras leaves (*Sassafras albidum*)

Grape leaves (*Vitis* sp.)

Winter cress (*Barbarea vulgaris*)

Dentaria californica

Water cress (*Nasturtium officinale*)

Wild mustard (*Brassica* sp.)

Penny-cress (*Thlaspi arvense*)

Garlic mustard (*Alliaria officinalis*)

[also 2 or 3 unidentified members of mustard family]

Cow-parsnip greens and stems (*Heracleum maximum*)

Wood sorrel (*Oxalis* sp.)

Greenbrier shoots (*Smilax* sp.)

Spiderwort pith (*Tradescantia* sp.)

Miner's lettuce (*Montia perfoliata*)

Spruce shoots (*Picea* sp.)

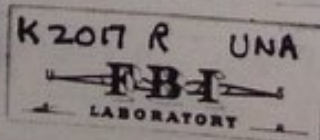
Sow thistle (*Gonchus oleraceus*)

Wild lettuce (*Lactuca scariola*)

Lamb's quarters (*Chenopodium album*)

Nettles (*Urtica dioica*)

Dock (*Rumex crispus*, *pulcher*, *arcticus*, and a broad-leaved species - probably *obtusifolius*, and one unidentified species)



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- Sheep sorrel (*Rumex acetosella*)
 Purslane (*Portulaca oleracea*)
 Cleavers (*Galium aparine*)
 Chickweed (*Stellaria media*)
 Strawberry blite (*Chenopodium capitatum*)
 Chickory (*Cichorium intybus*)
 Dandelion sprouts (*Taraxacum officinale*)
 Mallow (*Malva* sp. - *sylvestris*?)
 Seaweed (a kind of kelp, I believe)
 Day-lily buds (*Heimerocallis fulva*)
 Bracken shoots (*Pteridium aquilinum*)
 Ostrich-fern croziers (*Pteretis nodulosa*)
 Mountain sorrel (*Oxyria digyna*)
 Sweet cicely (*Osmorrhiza* sp.)
 Shooting star (*Dodecatheon* sp.)
 Yellow monkey-flower (*Mimulus guttatus*)
 Native water cress (*Cardamine Pennsylvanica*)
 Angelica (probably *saxatilis* *anglica* - A. Lucida)
 "Unknown Mustard" (an unidentified member of the mustard family - excellent)
 "Lance-leaf Mustard" (my name for another unidentified member of mustard fam.)
 Indian paintbrush flowering heads (*Castilleja miniata*)
 Brooklime (*Veronica* sp.)
 Waterleaf (*Hydrophyllum capitatum*) (both greens and roots).
 Brook saxifrage (*Saxifraga punctata*)
 Shepherd's-purse greens (*Capsella bursa-pastoris*)
 White Aster (*Aster ledophyllus* or *Engelmannii*)

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Potherbs and salads (continued)

Balsamroot leaves (*Balsamorhiza sagittata*)

Buds and young leaves of black currant (smooth-berried) *Ribes* sp.

Povertyweed (*Monoilepus nuttalliana*)

Miscellaneous vegetables

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Wild onions (*Allium* sp.)

Wild leeks (*Allium tricoccum*)

Wild garlic (*Allium* sp.)

Wild chives (*Allium* sp.)

Prickly-pear stems (*Opuntia* sp.)

Thistle pith

Burdock pith (*Arctium* sp.)

Cat-tail bloom spikes (*Typha latifolia*)

Milkweed buds and pods (*Asclepias* sp.)

'Salsify flowers

Alder buds (*Alnus* sp.) + *sil. green A*

(*ge. mintergub9*)

(*ge. mintergub9*)

(*amaritum ibarA*)

(*amaritum mureaA*)

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Roots

- Groundnuts (*Apios tuberosa*, or *americana*)
- Spring-beauty tubers (*Cheytoria virginiana*)
- Arrowhead tubers (*Sagittaria* sp.)
- Wild carrots (*Daucus carota*)
- Salsify roots (*Tragopogon* sp.)
- Cowas (*Lomatium utriculatum*)
- Camas (*Camassia* sp.)
- Bitterroot (*Lewisia rediviva*)
- Thistle roots
- Cat-tail roots (*Typha latifolia*)
- Dandelion roots (*Taraxacum* sp.)
- Rue-anemone tubers (*Anemonella thalictroides*)
- Day-lily roots (*Hemerocallis fulva*)
- Solomon-seal roots (*Polygonatum* sp.)
- False Solomon-seal roots (*Smilacina* sp.)
- Wild sarsaparilla root + tea therefrom (*Aralia nudicaulis*)
- Wild ginger root (*Asarum canadense*)
- Pepper root (*Dentaria* sp., probably *lacinate*)
- Indian cucumber-root (*Medeola virginiana*)
- Yampa root (*Perideridia gairdneri*)
- Bistort (*Polygonum* sp.)
- ²¹ Yellow Fritillary (*Fritillaria pudica*)

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Seeds

- Shepherd's-purse seeds (*Capsella Bursa-pastoris*) (Ground up for use in bread)
Peppergrass seeds (*Lepidium sp.*)
Pennygrass seeds (*Thlaspi arvense*) (ground up for use in bread)

(seeds in antennae?)

Nuts

- Black walnuts (*Juglans nigra*)
Hickory nuts (*Carya sp.*)
Pine nuts (*Pinus sp.*)
Acorns (*Quercus sp.*)

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Mushrooms

- Morel (*Morella esculenta*)
Shaggy-mane (*Coprinus comatus*)
Puffballs
Clavaria cinerea
Winter mushrooms (*Flammulina velutipes*)

Teas and seasonings

- Sagebrush (*Artemisia tridentata*) (seasoning and tea)
Red cedar foliage and tea (*Juniperus virginiana*)
Labrador tea (tea only) (*Ledum sp.*)
Douglas fir (*Pseudotsuga menziesii*) (tea only)
Snowbrush (*Ceanothus velutinus*) (tea only)
Yarrow (*Achillea lanulosa*) (tea only) (also as seasoning or small-quantity salad ingredient)

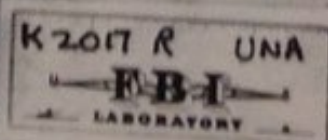
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Meats

- Birds' eggs (various small birds)
Crabs
Carp
Trout
Mountain whitefish
Snapping turtle
Grouse (Blue gr., ruffed gr., and spruce or Franklin gr.)
Squirrel (red squirrel) (*Tamiasciurus* sp.)
Rabbit (snowshoe) (*Lepus americanus* or related species)
Porcupine (*Erethizon dorsatum*)
Coyote (*Canis latrans*)
Wild duck (Gadwall; *Anas strepera*) (and Shoveler; *Spatula dyspeata*)
Marmot (yellow-bellied) (*Marmota flaviventris*)
Muskrat (*Ondatra zibethica*)
Deer (mule deer) (*Odocoileus hemionus*)
Steller's jay (*Cyanocitta stelleri*)
Elk (Wapiti — *Cervus Canadensis*)
Weasel (*Mustela* sp. — probably ^{fronata} ~~rupestris~~)
Wood rat (*Neotoma* ~~sp.~~ *cinerea*)
Leopard Frog's legs (*Rana sphenocéphala*)
Ground squirrel (*Citellus columbianus* ~~richardsoni~~)
21 Flying squirrel (*Glaucomys sabrinus*)
White-footed mouse (*Peromyscus* sp.)
Canada Jay (*Perisoreus Canadensis*)



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Beaver (*Castor canadensis*)

Grasshoppers, boiled

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(*Thryomanes bewickii*)

(*Thryomanes bewickii*)

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(*Thryomanes bewickii*)

(*Thryomanes bewickii*)

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Wild foods I have eaten

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Fruits

- May apples (*Podophyllum ~~peltatum~~ peltatum*)
 Crab apples (*Pyrus* sp.)
 Haw apples (*Crataegus* sp.)
 Rose hips (*Rosa* sp.)
 Red raspberries (*Rubus* sp.)
 Black raspberries (*Rubus* sp.)
 Blackberries (*Rubus* sp.)
 Strawberries (*Fragaria* sp.)
 Serviceberries (*Amelanchier* sp.)
 Blueberries & huckleberries (various kinds) (*Vaccinium* sp.)
 Northern mountain cranberries (*Vaccinium* *Vitis-Idaea*)
 Wintergreen berries (*Gaultheria procumbens*)
 Gooseberries (*Ribes* sp.)
 Black currants (*Ribes* sp.)
 Red currants (*Ribes* *triste*)
 Blood currants (*Ribes sanguinarium*)
 Elderberries (*Sambucus canadensis*)
 Berries of blue-berried elder (*Sambucus glauca*)
 Red mulberries (*Morus rubra*)
 Squashberries (*Viburnum* - probably *edule*)
 Sweet viburnum berries (*Viburnum lentago*)
 Blackhaws (*Viburnum ~~pauciflorum~~ prunifolium*)
 Prickly-pear fruit (*Opuntia* sp.)
 Yew berries (*Taxus canadensis*)
 False Solomon-seal berries (*Smilacina* sp.)

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- ②
- Wild grapes (*Vitis* sp.)
 - Wild cherries (*Prunus* ~~sp.~~ *serotina* and other species)
 - Sand cherries (*Prunus pumila*)
 - Wild plums (*Prunus* sp.)
 - Greenbrier berries (*Smilax* sp.)
 - Ground cherries (*Physalis* sp.)
 - Soapberries (*Shepherdia canadensis*)
 - Twinberries (*Lonicera utahensis*)
 - Lonicera involucrata* berries
 - Oregon grapes (*Berberis repens*)
 - Golden currant (*Ribes aureum*)
 - Mountain ash berries (*Sorbus* sp.) (as jelly only)
 - Dogwood berries (*Cornus sericea*)
 - " Liverberries (Twisted-stalk, *Streptopus amplexifolius*)

(usually succulent)

(spotted underneath)

(mitochondria ~~mitochondria~~ *mitochondria*)

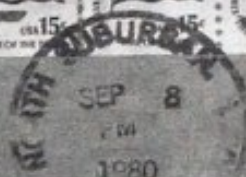
(sp. 1/2 in)

(some are sweet)

(greenish white)

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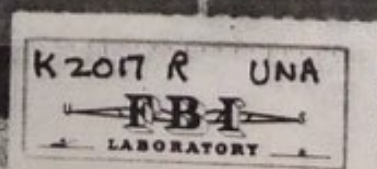
FIRST CLASS

T. J. KACZYNSKI
STEMPLE PASS ROAD
LINCOLN, MONTANA

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Kaczynski
464 N. Ridge
Lombard, Ill. 60148



FIRST CLASS

FIRST CLASS

T. J. KACZYNSKI
STEMPLE PASS
LINCOLN, MONT.

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ts Notes on Montana Wilderness

Knapp
1964

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uments Notes on Montana Wilderness

Knapp
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Notes on Montana Wilderness

Notes on edible
wild plants

RANGE: St. John valley, New Brunswick, to the Pacific, and to the Tropics.

SEASON OF AVAILABILITY: late autumn or early spring, the tubers being over winter.

USES: farinaceous vegetable, flour, drink, coffee-substitute.

CHUFA has long been a popular food with the Indians and a cultivated strain of *Cyperus esculentus* brought from Africa, is now somewhat cultivated in the Southern States. Experiment has shown, however, that the cultivated strain, derived from tropical or subtropical Africa, cannot be cultivated with success in the Northern States, although we have a native plant which differs only in its smaller tubers, which are borne separately from the parent plant and not in such abundance as the cultivated variety. The tubers are slightly starchy and nutty, but with a tough, dry rind which is not masticated; they are commonly boiled, sometimes fried, or they may be ground and made into a paste and wholesome flour.

Chufa, as indicated by Sturtevant, was so valued in ancient times that its tubers were placed in Egyptian tombs dating back to more than 2000 years before Christ. In other parts of the Mediterranean region and as far as England they are sent to market and nibbled as dainties or prepared as a conserve; and states that, in the 18th century, "it was employed as a substitute for coffee in the whole of Germany." Loudon speaks of it as grown in Hungary for medicinal purpose.

A Spanish recipe for a refreshing drink from Chufa is to soak for 48 hours a half-pound of the tubers, macerate in 1 quart of water, $\frac{1}{2}$ pound of sugar and then strain the liquid through a sieve and serve as a drink or use as ices.

~~Chufa~~ or Peruvian
Cyperus Gairdneri (Yarrow)

tuberous or clustered
white flowers, involucre
hairless, flattened
ridged with oil-tubercles
Leaves usually simply
leaflets 5-15 a
involucre of several
linear to taper-point
fruit with long slender
(Also one or more)

~~Lomatium~~

Lomatium (Cowan)
Leaves several times
flattened, the lateral,
species utriculatum

Dissected, flowers go
in the earliest plants
barely rising above
inflated and veined, 1
in diameter, nearly
without subtending
like clusters of small
at the base of the

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~~Utricularia~~

or *Perideridia Gairdneri*

Carum Gairdneri (Yampa) smooth erect, slender, roots
tuberous or clustered, ^{or spindle-shaped} pinnate leaves with few linear leaflets,
white flowers, involuclers of few to many bracts. Fruit
hairless, flattened laterally, but nearly round, apparently
ridged with oil-tubes ~~solitary~~ in the intervals.
Leaves usually simply pinnate (lower may be bipinnate)
leaflets 5-15 cm. long, umbels with 6-15 rays,
involucre of several bracts or none, involuclers of
linear to taper-pointed bractlets, rays $2\frac{1}{2}$ - 4 cm long
fruit with long slender style.

(Also one or more similar species)

~~Lomatium~~

Lomatium (Covas): Perennials with thick roots.
Leaves several times divided, mostly basal. Fruits
flattened, the lateral ribs with thin wings.

species *utriculatum* — "Spring gold": leaves minutely
dissected, flowers golden yellow. Stems 3-12 in tall,
in the earliest plants, leaves spread on ground, stems
barely rising above ground. Petioles conspicuously
inflated and veined, often reddish. umbels $\frac{3}{4}$ - $1\frac{3}{4}$ in
in diameter, nearly flat-topped, rays 5-7 or more,
without subtending bracts, rays unequal, ending in head-
like clusters of small yellow flowers subtended
at the base of their short pedicels by several short,

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broad bractlets. fruits $\frac{1}{4}$ " long, elliptic, brown and yellowish striped, wings broad, thin, yellowish.

Hillsides. One of the earliest spring flowers, when plants are scarcely above the surface. Later plants are taller.

Petasites speciosa ^{→ compositae} (sweet coltsfoot) Flowering stalks arise very early in spring, closely covered with broad ^{ovate} clasping scales, flowers white or pinkish.

Leaves ~~green~~ green and smooth or short-hairy above, covered beneath with dense felt-like surface of white hairs. Shaded stream-banks. ^{Creeping rootstocks.}

Petasites nivalis Alpine coltsfoot. Differs in having leaves mostly ovate-cordate, 5-7 lobes.

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ute for celery. The
when raw a strong
palates it would be
more waters. The
young shoots are sometimes candied like Angelica.

Theriacal

Sarcobatus

Verniculatus

A subspineous rigidly
branched shrub with alternate
linear fleshy leaves, and
hastate fronds, or
divisions. Flowers. Staminate
flowers without calyx, in
dense terminal spikes; stamens
2-5, irregularly arranged
under a stipitate peltate
scale. Pistillate flowers
petaloid; the
perianth adherent at the

contracted somewhat
2-lipped apex to the base
of the stigma, laterally
marginated by a narrow
erect slightly 2-lobed
border, which at length
becomes a broad double
horizontal membranous
veined wing; style
lateral, terminated by a
thick exserted unguis
of the stigma. [Style: the stalk
of the stigma, in pollen - mature.
Pistillate: calyx and operculum
blanched slightly pubescent
on young twigs with smooth
white bark, 1 1/2 - 4 1/2 ft high
leaves pale green, somewhat
3-angled with 3-5 ft long

PLATE V



FENNEL

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Chasewood

Sarcobatus
vermiculatus

A subspinescent rigidly branched shrub with alternate linear fleshy leaves, and bractless monoecious or dioecious flowers. Staminate flowers without calyx, in close terminal spikes; stamens 2-5, irregularly arranged under a stipitate peltate scale. Pistillate flowers solitary, axillary; the perianth adherent at the

contracted somewhat 2-lipped apex to the base of the stigma, laterally margined by a narrow erect slightly 2-lobed border, which at length becomes a broad circular horizontal membranous veined wing; style lateral, terminated by 2 thick exserted unequal stigmas. [Style: the stalk of the stigma, or pollen-receiver. Perianth: calyx and corolla] Glabrous or slightly pubescent on young branches with smooth white bark; 1 1/2 - 4 ft high; leaves pale green, somewhat 3-angled, 2-5 cm long; ^{noted rather flat}

Labrador tea as
insecticide, and perhaps
repellent.

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Cherry bark bitters & whiskey

To make reindeer moss edible:

with baking soda

in plain water,

throwing off the
by the moss

Stalking
the Wild
Asparagus

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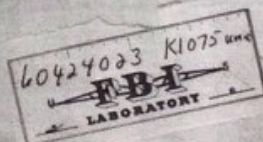
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STALKING THE WILD ASPARAGUS

Today we saw many trees with comparatively small nuts but passed them by. We finally located two trees with very large nuts. One of these was growing right beside a dirt road in the country and the ground was littered with the fallen nuts, many of them already husked being run over by the tires of passing automobiles. We cracked one open and saw that this would be a fairly easy nut to shell (for a black walnut), so we started loading our baskets. I have heard of many ways to remove the hull from a black walnut, but the easiest method I have heard of is to wear a heavy pair of shoes while gathering nuts, and to stand each nut under your heel right where it lies under the tree. This will break off the husk and one can toss the hard-shelled nut into a basket. Always wear a pair of rubber or plastic gloves, for, if the shelled nut is handled with bare hands, it will leave a brown stain in that is almost impossible to remove.

Black walnuts are hard to shell, there's no denying it, but the meat is rich and highly flavored, and this flavor comes through in baked products beautifully, so I believe the black walnuts are well worth the trouble. I know no short-cut method of shelling them; one just uses a heavy hammer and a nutpick and the rest of it is just work. The flavor of black walnut combines so well with chocolate that this is the nut to use in Fudge. Here is the recipe that we like best. Melt the sides of a large saucepan and in it put 4 cups of sugar, all can of evaporated milk and 1/2 pound of butter or margarine. Mix this together and cook until a drop of it will form a soft ball when dropped in cold water, or until it reaches 236° on your candy thermometer. Remove from heat and add 2 cups of semisweet chocolate bits, 1 pint jar of marshmallow topping and 1 cup of black walnut meats. Beat until chocolate bits are melted and blended then stir into a bake pan to cool. Score in squares while still warm.

For those who dislike chocolate, here is a Brown Sugar Fudge that we found to be very good. In a buttered, 2-quart saucepan place 1 cup of granulated sugar, 1 cup of brown sugar, 1/2 cup of light cream, 1/2 cup of milk and 2 tablespoons of butter. Heat and stir until mixture comes to a boil, then cook until it reaches 238° (soft-ball stage) stirring only when necessary. When the thermometer shows that it has reached the proper heat, remove from fire and cool until it is barely lukewarm without stirring again. Then beat until the fudge thickens and loses its gloss. Quickly stir in 1/2 cup of black



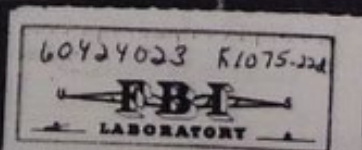
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Notes on Montana Wilderness

To make reindeer moss edible:

soak for 2 days in water with baking soda added. Then boil 3 times in plain water, 20-30 min each time, throwing off the water. Then, preferably, dry the moss before eating.

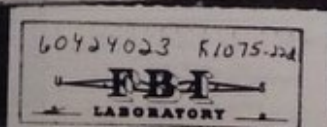
K1075-22 D
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pages 214-215



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John D. Hunter

Manners and customs of Several Indian
~~tribes~~ Tribes located West of the
Mississippi

Ross & Haines, Inc. Minneapolis, Minnesota,
1957

(Original edition 1829)

p. 181 ① The osage orange tree is discussed on p. 181.
He says: the wood is elastic and is very good
for making bows.

② Fruit ripens in early part of fall, spherical,
pale yellow colored, size of a large egg.
Slightly pulpy, and acid. It is "by many of
the Indians esteemed as an agreeable esculent."
[Dictionary says "esculent" means "edible".]

p. 370 ② "Was-saw - Bape - sha" or "bear's fright."
A small ~~annual~~ annual plant, growing in
abundance on hills in western territories. Has
strong disagreeable smell, and because of this
is supposed to be an effective bear-repellent.

p. 371 ③ Bear fat alone, or Bear-fat mixed with buckeye
leaves is very good mosquito repellent.

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371 ④ "Sha-Ba-Wa-Nem-bra" or "beaver root".
Very much resembles the common carrot in size and appearance but "in taste it is agreeably bitter". Used as a tonic. Also used as bait for ~~the~~ beavers, who are very fond of it.

p. 377 ⑤ "Wesh-ke-Nah" or flax weed. grows in the fissures of rocks; 10 or 12 inches high. ~~with many branched roots.~~ "the root sends off many ~~the~~ branches, which in July produce numerous small pale blue ~~the~~ flowers". The plant is gathered while in blossom. The roots, leaves and stalks are made into a decoction, and given freely to the patient, as warm as he can conveniently take it. This is supposed to be a very rapid and effective cure for asthma, and coughs.

The author also gives a list of ~~many~~ many other medically useful plants.

K1075-22C
from
p. 214-215

60424023 K1075-22C

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Wintergreen leaves contain an aspirin-like substance.

Bearberry leaves are good for kidney and urinary infections - they contain a substance which disinfects urinary passages.

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Cherry bark bitters & whiskey — Tonic

Yellowroot (bitter) — Tonic

She-balsam bark - brewed into Kidney Tea

Doe tea — Kidney tea

Sage - common cold.

Pennyroyal - "pneumonia fever" - neuralgia

Catnip and dock leaves - nervous headache.

Dock leaves poultice - draw soreness out of boils

Dried onion with goat tallow - salve for sore throat

Almonds & honey - whooping cough

Asafetida & whiskey - tea used to cure liver

Digitals from purple foxglove

Cresote from wood tar of the pine or beech for
bronchitis & coughs

Belladonna from deadly nightshade for pain of inflammation and constipation.

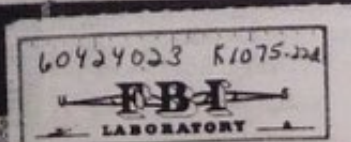
Arnica from dried flowers of the leopard's-bane for
bruises & cuts.

Pokeroot for eczema

Oil of thyme for diphtheria & typhoid

Hemlock to relieve pain of cancer.

Jimson root for ulcers and to help palsy.



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Notes on Montana Wilderness

Wolfsbane root for fevers

Sassafras and boneset and snake root for tonic

Tannic acid from prickly ash and white oak
and black berry root

clover for salve and astringent

Bloodroot for corns

Honeysuckle - Native American plant. Identical Japanese
species a favorite vegetable in Japan.

K1075-22A 22A
pages 214-215

60424023 K1075-22A

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Notes on Montana Wilderness

1912

A letter of mine,
and printed materials
related to forestry
practices. I wrote for
this stuff when I
learned that the Gehrings
were going to cut trees
near my property.

00004839
Inputted
4/24/97
In Chron.

This must have been
in the box under the
shelves in SE corner
of cabin.

T. J. Kaczynski
Stemple Pass Road
Lincoln, Montana 59639
May 28, 1985

JUN 03 1985

Lewis and Clark County
Conservation District
Federal Building
Helena, Montana

Dear Sirs:

A logging operation is planned for the land adjoining my property and I am concerned that it should be conducted in such a way that the quality of the water in the stream flowing across my property will not be damaged. This logging is to be done on private land. I understand that there is a set of guidelines called "Best Forest Practices" or "Best Management Practices" or something like that outlining proper methods for logging operations to ensure that there will be no problems with erosion, contamination of streams with fuel or antifreeze, and so forth. I would appreciate it if you could send me a copy of these guidelines, or two copies if possible. If there is a charge for this material, please let me know and I will send the money. Thank you.

Sincerely yours,

T. J. Kaczynski

T. J. Kaczynski

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Documents
Notes on Montana Wilderness
1 of 2

Documents

Notes on Montana Wilderness

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LEWIS & CLARK COUNTY CONSERVATION DISTRICT
SEDIMENT CONTROL PROGRAM

INDEX OF BEST MANAGEMENT PRACTICES

<u>PRACTICE</u> (Alphabetical Listing)	<u>CODE</u>
Access Road.	560 A
Chiseling and Subsoiling	324 A
Conservation Cropping System	328 A
Contour Farming.	330A
Cover and Green Manure Crop.	340 A
Critical Area Planting	342 B
Crop Residue Management.	344 A
Crop Residue Use.	344A
Stubble Mulching.	344B
Debris Basin	350 A
Deferred Grazing	352
Dike	356 A
Diversion.	362 A
Emergency Tillage.	365
Fencing.	382 AC
Field Border	386 E
Field Windbreaks	392 A
Grade Stabilization Structure.	410 A
Grassed Waterway or Outlet	412 A
Grasses and Legumes in Rotation.	411 A
Grazing Land Mechanical Treatment.	548 C
Heavy Use Area Protection.	561 E
Irrigation System, Tailwater Recovery.	447 A
Irrigation Water Management.	449 A
Lined Waterway or Outlet	468
Livestock Exclusion.	472 C
Minimum Tillage.	478

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Documents Notes on Montana Wilderness

1 of 2

PRACTICE

CODE

Mulching.	484 A
Pasture and Hayland Management.	510 B
Pasture and Hayland Planting.	512 B
Planned Grazing System.	556 C
Proper Grazing Use.	528 C
Range Renovation.	548
Range Seeding	550 C
Recreation Area Improvement	562 F
Recreation Trail and Walkway.	568 F
Rock Barrier.	555 A
Spoilbank Spreading	572 B
Spring Development.	574 C
Stream Channel Stabilization.	584 A
Streambank Protection	580 A
Blanket Rock Riprap.	580A A
Vegetative	580B A
Stripcropping	585 A
Contour.	585A A
Field.	585B A
Wind	585C A
Structure for Water Control	587 A
Stubble Mulching.	344 B
Tall Wheatgrass Barriers.	Interim
Waterspreading.	640 A

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1 of 2

LEWIS & CLARK COUNTY CONSERVATION DISTRICT
SEDIMENT CONTROL PROGRAM

GUIDELINES FOR FORESTRY ACTIVITIES

A. FOREST ROADS:

1. Road Location and Design

Forest roads are constructed for a variety of standards and put to a variety of uses. Road construction and use has been shown to be the major contributor to sediment production in forested areas.

Proper road location and design has been shown to significantly reduce water pollution from forest roads. The following location and design guidelines have been shown to accomplish this purpose.

- Minimize road cuts and fills, and place structures to handle expected surface runoff from the area.
- Minimize the number of roads constructed through comprehensive road planning, recognizing all foreseeable future uses.
- Design road and locate road to avoid steep slopes, erodible soils and geological hazard areas.
- Design road profiles and structures to prevent or disperse surface runoff from the running surface by outsloping or ditching where necessary.
- Design road with short and long-term stabilization of cut and fill slopes, as well as the road surface.
- Design road to make seasonal use needs and maintenance activities compatible with minimizing erosion from the road.
- Fit road to landscape to avoid concentrating runoff in areas which cannot adequately handle such increased runoff. Design drainage so that water is dumped over the end of a ridge rather than in a draw. This will disperse rather than concentrate water.
- Avoid long sustained road grades.
- Avoid creek bottom road locations which place the road or fill with the high water lines of streams.
- Seek to maintain all vegetation between roads and streams to assist in preventing sediment from entering the stream.
- Design drainage structures and bridges to function under long-term use.
- Minimize the number of stream crossings.

2. Road Construction:

Road construction exposes mineral soil, creates sloping erodible surfaces and alters surface drainage patterns of the area. The following guidelines minimize water pollution from the actual construction process.

- Avoid unnecessary soil and vegetation disturbance at stream crossing sites and adjust road drainage to prevent it from entering the stream.
- Compact and protect road fills in the highwater zone of streams to avoid loss of fill material.
- Roll the grade and gently outslope the road wherever possible to disperse surface runoff.
- Deposit waste material only in areas which will not enter streams during high water or during the runoff period.

3. Road Maintenance:

Roads once constructed must be maintained during their period of use. The following guidelines relate to maintenance of permanent and temporary forest roads.

Permanent Roads:

- Maintain running surface by reshaping and graveling to avoid rutting and resultant accelerated erosion of the road surface.
- Annually, prior to the runoff period, inspect erosion control and drainage structures to insure they are in satisfactory condition. This should be done in the fall as many roads are inaccessible in the spring during the runoff period.
- Restrict use of road during the spring breakup period or at other times when road damage is likely to occur.
- Promote or maintain vegetation on the road surface and cut and fill slopes to stabilize such surface.
- Use oils or water to reduce the dust from heavy use during dry periods.
- All chemical or oil applications to the road surface should be in such a manner as to prevent immediate or delayed contamination of streams and water bodies.

Temporary Roads:

Temporary roads should be stabilized after use and may be closed to further use. The following guidelines apply to temporary roads.

- Drainage and erosion control structures should be designed to require no further maintenance after the period of use is ended.

Documents Notes on Montana Wilderness

1012

- Stabilization of the road surface and cut and fill slopes by vegetation is the preferred method of stabilizing exposed mineral soil surfaces.
- Use of such roads which would cause damage to the road surface and erosion control structures should not be permitted.

4. Bridges, Culverts and Stream Crossings:

These three situations require special attention to assure that a minimum amount of water pollution is generated by their operation or use. The following guidelines will minimize water pollution possibilities by keeping the water flowing where it would flow naturally.

a. Bridges:

- Stabilize and protect bridge approaches by the use of vegetation and physical means and as riprap to above the highwater mark.
- Maintain structural integrity of bridge by periodic inspection and maintenance to avoid the chance of sudden structural failure and loss of fill material.
- Align bridge perpendicular with flow of stream.

b. Culverts:

- Place culvert in such a manner that its continued function is not impaired.
- Size culvert such that anticipated peak flows will be handled without failure. Design system roads for 25-year flow at minimum.
- Protect fill slopes from culvert discharge to avoid loss of fill material.
- Remove debris from ditches above the culvert intake and upstream from a culvert stream crossing for a minimum distance of 50 feet for culverts under 24 inches in diameter.
- Avoid sloping culverts greater than three degrees from the horizontal.
- Compact fill around culvert during placement to avoid failure by undercutting.
- Avoid excavation of streambed during the placement of culverts.
- Align culvert parallel to flow.
- Use mitered inlets (where needed) on culverts so they will operate at optimum efficiency.

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Documents
Notes on Montana Wilderness

10/2

c. Stream Crossings:

- Do not locate stream crossings on strictly a grade basis. Choose stable site and adjust grade to it.
- On stream crossings where placement of a culvert or bridge is not desirable, locate crossing site on a stable rocky portion of the stream.
- Avoid using this type of unimproved stream crossing whenever possible.

B. FOREST PRODUCT HARVESTING OPERATIONS:

Forest products harvesting operation removes or modifies existing vegetation and exposes and rearranges the soil surface. The following guidelines attempt to minimize water pollution resulting from this operation.

1. Tree Cutting:

- Avoid falling trees or leaving other organic debris in streams or water bodies. Remove all such trees and debris as soon as possible.

2. Skidding:

- On moderate and steep slopes, skid trails should be constructed in such a way as to avoid concentrating runoff. Erosion control measures such as water bars or kelley humps should be installed in the fall before the runoff period.
- Where large areas of mineral soil have been exposed and natural revegetation is inadequate to prevent accelerated erosion, seeding of skid trails should be carried out before the next growing season. Placing hay or straw on skid trails before snowfall will retard erosion in the spring.
- Dozer skidding on steep slopes with the blade attached to slow descents should not be used because of the creation of vertical erosion channels.
- Do not skid trees through streams or bodies of water.
- Whenever possible, suspend the head end of the log to minimize soil gouging.
- Use a logging system which minimizes damage to area. Steep slopes and erodible soils require special skidding equipment and logging techniques.

3. Decking:

- Avoid decking logs in or immediately within the highwater mark of any stream or body of water.

- 4 -

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Documents
Notes on Montana Wilderness
10/12

Documents
Notes on Montana Wilderness
1012

- Provide a vegetative buffer between landing areas and streams or other bodies of water. Surface drainage from landings should not be allowed to directly enter stream channels.
- After use, landings should be revegetated as quickly as possible.

4. Processing in the Woods:

- Small sawmilling operations frequently occur in the woods. Residues from these operations can affect water quality if insufficient care is taken. General guidelines to reduce water pollution from these activities are as follows.
- Avoid depositing residues (slabs, edging, sawdust and branches) within the highwater boundaries of streams or bodies of water.

C. SITE PREPARATION AND SLASH DISPOSAL ACTIVITIES:

In connection with various forest practices, the forest floor is intentionally disturbed for the purpose of creating a suitable mineral soil surface or to modify an existing unsatisfactory condition, such as the disposal of logging slash or competing vegetation. Such activities generally expose mineral soil and reduce the protective effect of existing vegetation, thus increasing both erosion potential and sediment production from the area. The following guidelines are directed at reducing the amount of pollutants resulting from this practice and are in addition to those provided on the State of Montana's Hazard Reduction fact sheet.

General:

The amount of mineral soil exposed should be minimized wherever possible to achieve the stated management goal.

Scarification should be minimized or eliminated on highly erodible soils or in geologic hazard areas where soil mass movements are highly likely.

Generally, the less soil disturbance that occurs during site preparation or slash disposal activities, the less sediment will be produced from the area.

Adequate vegetative buffer strips should be maintained between site preparation areas and water bodies (ponds, lakes, etc.), flowing water (rivers, streams), or intermittent channels.

1. Mechanical Scarification - Scarification:

- Mechanical scarification activities by bull dozers and other equipment on slopes should minimize or eliminate elongated mineral soil surfaces perpendicular to the slope.
- Use brush blades on cats when piling slash. Use of dozers with angle blades generally creates active sediment producing erosion surfaces particularly on slopes. Site preparation equipment producing irregular exposed surfaces are preferred.

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- Use of cats may be restricted as to time of year depending on soil-water conditions.

2. Prescribed Burning:

- An unburned buffer strip should be provided between prescribed burned areas and all water bodies (ponds, lakes, streams, etc.) to prevent surface runoff into these areas.
- Prescribed burning activities within any given drainage should be timed and coordinated to minimize impact to water bodies within the drainage.

3. Chemical Site Preparation Methods:

Such chemicals are generally used to reduce or eliminate competing vegetation. However, the elimination of such vegetation reduces the general vegetative cover of the area increasing the likelihood of pollution from increased sediment production and chemical contamination.

- Chemical methods of vegetation control should not include direct application of chemicals to water bodies. Suitable buffer strips should be provided between chemical application areas and all water bodies.
- During chemical application operations, mixing and disposal of chemicals should not be considered in such a way as to allow direct entry of chemicals into drainage ways or water bodies.

D. REFORESTATION AND AFFORESTATION:

A variety of artificial and natural methods are used to re-establish or establish forest stands. Water pollution from these activities is generally indirect resulting from site preparation and/or slash disposal practices.

- Rapid reforestation of harvested areas is encouraged to rapidly re-establish long-term protective vegetative cover on the area. Short-term low vegetative cover, which does not unduly hinder the establishment of trees, should be considered.
- Mechanical tree planting of erodible soils on slopes should be on the contour whenever possible. Minimum site preparation to meet reforestation objectives should be the reforestation goal in such situations with preference given to spot planting whenever possible.

E. INTERMEDIATE STAND TREATMENTS:

Intermediate stand treatments are all treatments or cuttings made in the stand after the stand has been reproduced, but prior to maturity. Intermediate cutting can be used to control stand density (thinnings), to regulate species composition and quality in young stands (release cuttings),

- 6 -

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Documents
Notes on Montana Wilderness

1 of 2

R 22 P 1 202

to improve the composition and quality of older stands (improvement cutting), and to remove branches (prunings). For the most part, little direct effect occurs on water quality except in the following situations:

- Deposition of branches and other organic debris from these practices in water bodies and drainage ways.
- Significant removal of streamside trees and vegetation resulting in increased stream temperatures or destabilization of streambanks.
- Skidding commercial forest products through streams or drainage ways.
- Construction of roads and skid trails in such a manner that significant quantities of sediment are deposited in water bodies and/or continuous erosion surfaces are created.
- Deposition of fertilizers in water bodies or drainage ways. This can occur during aerial application of fertilizers.

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Documents Notes on Montana Wilderness

1 of 2

R 222 P 1 203

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Documents

Notes on Montana Wilderness

1 of 2

Erosion Control Guidelines for Urbanizing Areas of Lewis and Clark County

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United States
Department of
Agriculture

Soil
Conservation
Service

Bozeman,
Montana



Erosion Control Guidelines for Urbanizing Areas of Lewis and Clark County

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Documents

Notes on Montana Wilderness

1 of 2

K2017 AA UNA
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Documents Notes on Montana Wilderness

FOREWORD

The Soil Conservation Service is concerned with the soil, water, plant, and related resources aspects of resource plans developed by land users. Land disturbance associated with residential, industrial, and commercial developments contributes to the problem of soil erosion and sedimentation. Data and information provided by the SCS can be used in planning and applying adequate Soil, Water, and Plant Management Systems on developing areas by land users.

This handbook is intended to provide guidance and assistance to land users in developing urban and urbanizing areas in Lewis and Clark County.



Van K. Haderlie
State Conservationist

May 1981

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1 of 2

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